

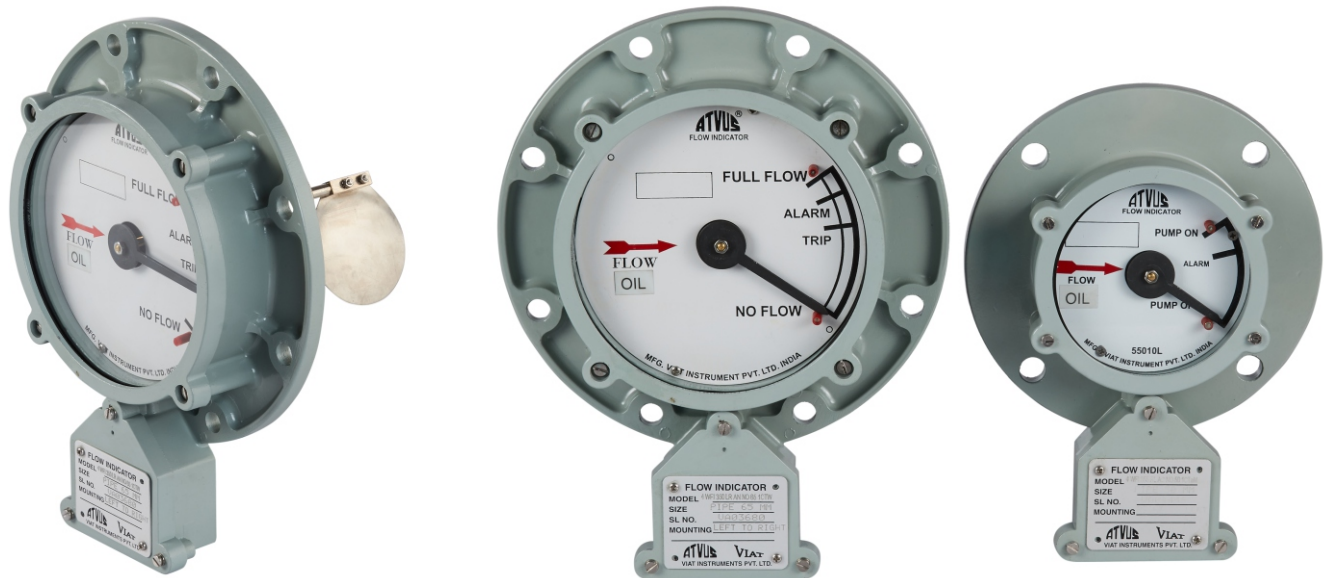
FLOW INDICATORS

Fluid: Oil or Water

Installation pipe sizes: 50mm (2") to 200mm (8")

Dial Sizes: 100mm (4") and 150mm (6")

With or without plug and socket connection



FEATURES

- Sealed design to ensure factory calibration cannot be tampered with easily on site or after installation
- Minimal cross sectional area across pipe of vane at full flow rate ensures negligible head loss.
- Maintenance free micro-switch contacts are not affected by dust, humidity, magnetic fields or corrosive environment.
- Every piece individually calibrated and tested to conform to specified full flow rate and switching.
- Does not get damaged by excess or reverse flow
- All Aluminium, brass and SS body and components
- Magnetic coupling with powerful and robust neodymium magnets
- Every unit tested for porosity
- Contacts: 1-2 switches, NO, NC or changeover contacts
- Standard switch setting for alarm at 70-80% and trip at 60-70% of full flow rate. Other configurations also available.

VIAT
INSTRUMENTS

AT05R2

ATVUS®

FUNCTION AND APPLICATION

Flow indicators, as used in power transformers with forced circulation of liquid, are safety devices that protect against the failure or degradation of pumps circulating the cooling fluid.

The product performs the following functions

- 1) It indicates if the flow in the pipe is in the correct direction
- 2) It acts as an verification during transformer installation that the design flow rate of liquid has been achieved.
- 3) It provides change of electrical contacts if the flow rate falls below predetermined limits.

WORKING FLUID

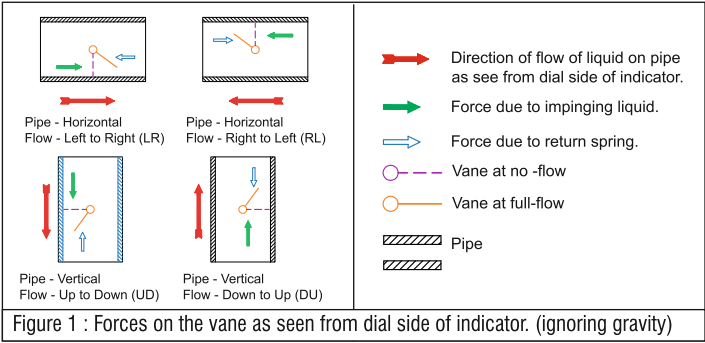
The product can be designed for use with water or transformer oil. The working fluid needs to be specified during ordering. The product can be designed for use with other fluids if the specific gravity is provided during enquiry.

CONSTRUCTION AND WORKING

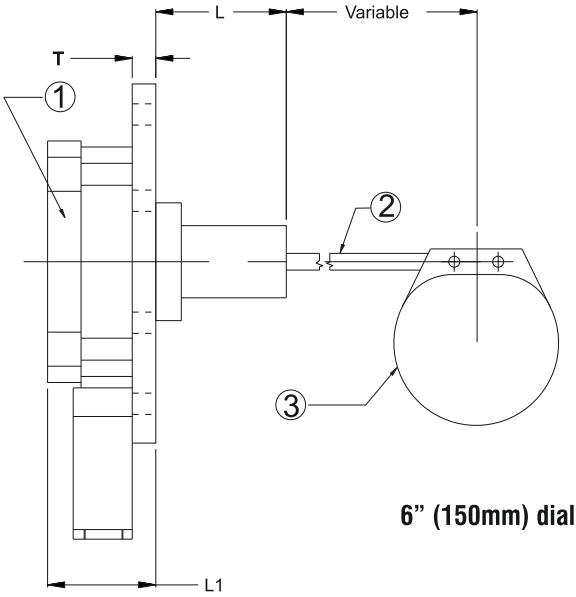
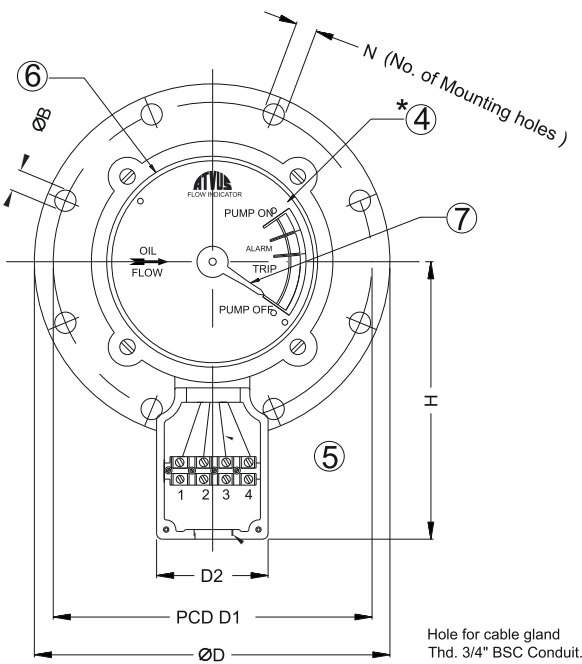
A suspended vane is exposed to the flow of liquid in the pipe, with its surface at right angles to the direction of flow. When liquid starts flowing in the pipe, the vane is deflected, turning the vane shaft around. This turning is used to indicate flow inside the pipe and to operate limit switches as needed.

The vane shaft is connected to a neodymium magnet that drives another identical magnet on the other side of a nonmagnetic wall. This follower magnet is on the dial side of the flow indicator, and is connected to the pointer and a mechanism that triggers the limit switches.

The rotation of the vane shaft is opposed by a torsion spring. A steady pointer reading is caused by an equilibrium of torque generated by the action of the impinging liquid on the vane and the opposing torque of the torsion spring. When the flow in the pipe falls, the force on the vane reduces, and the torque of the spring on the vane shaft overcomes that exerted by the liquid flow, resulting in the pointer displaying a fall in flow. Figure 1 illustrates the operation of the vane.



The pointer does not remain steady for unsteady flows.



DIMENSIONS

DIAL SIZE	ØD	D1	D2	ØB	H	T	L	L1	N
100 mm.	Ø189	165	58	14	150	12	81	50	4
150 mm.	Ø234	209.7	58	13	175	12	81	55	8

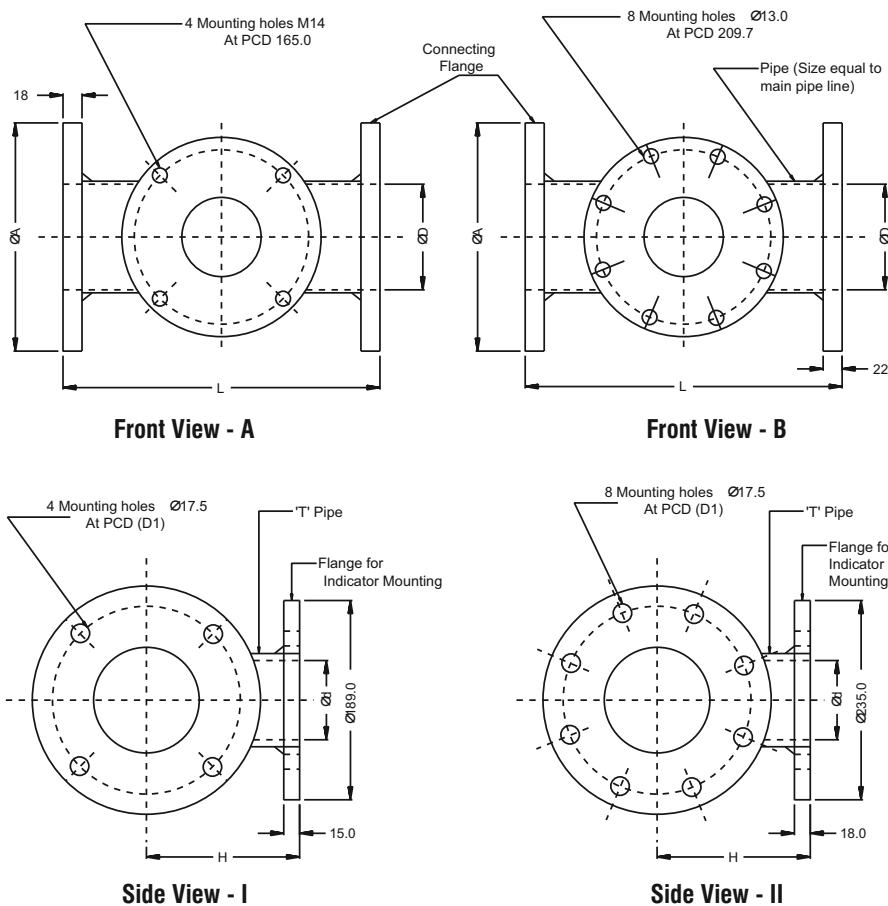
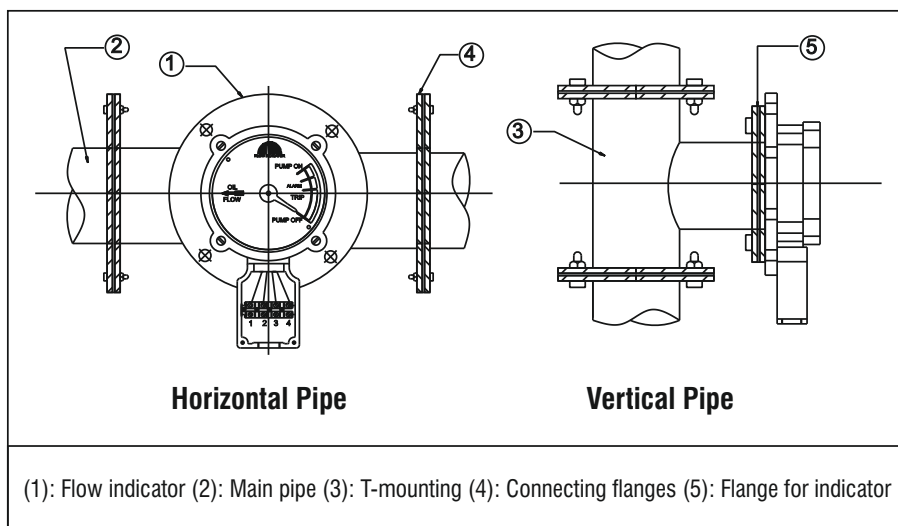
PARTS LIST

ID	DESCRIPTION	MATERIAL
1	Main body and cover	Aluminium alloy
2	Vane shaft	Brass
3	Vane	Stainless steel
4	Limit switch (behind dial)	Honeywell
5	Connecting wire	1mm3 (14/0.3mm) PVC
6	Dial (4"/6")	Aluminium
7	Pointer	Aluminium
8	Lens	Toughened glass

MOUNTING:

The product is installed on a section of the pipeline between the transformer and radiators using a T-mounting. Flow indicators can be made for both horizontal and vertical mounting with any flow direction. (See figure 3)

It is necessary to use a T mounting to install a flow indicator in a pipeline. Below are the dimensions of T-mounting required for each configuration of dial size and main pipe size. If rate of full flow is less than minimum required, VIAT will supply a special T-mounting with reduced flow area near vane.



T Mounting Detail

DIAL SIZE	PIPE SIZE (D)		DIMENSIONS						
	mm	inch	Refer Front View	Refer Side View	Flange Dia (A)	Total Length (L)	T- Pipe Dia (d)	Projection (H)	PCD (D1)
4"	80	3"	A	I	184	285	80	120	146
4"	100	4"	A	I	216	300	75	145	177.8
4"	150	6"	A	I	279	300	100	165	235
4"	200	8"	B	II	336	300	100	185	292
6"	150	6"	B	II	279	350	150	165	235
6"	200	8"	B	II	336	350	150	185	292

SPECIFICATIONS

Liquid	Water or oils
Pipe size	2" to 8" (50mm to 200 mm)
Switches:	One, two or none.
Switch rating	5A, 240 V AC and 0.5A, 240 V DC
Environmental protection	IP 67 as per EN 60529:1992
Working temperature in liquid	0 to 100°C
Static pressure	OFl: 5kg/cm ² WFI :7.5kg/cm ²
Dielectric test	2KV AC for 1 minute between body and live terminals 1KV AC for 1 minute between contacts

CONFIGURATION AND ORDERING

The flow indicator is available in a variety of configurations and ordering can be done by specifying the model numbers and quantities.

Direction of flow in pipe
 LR: Left To Right
 RL: Right to Left
 UD: Up to Down
 DU: Down to Up

Pipe Size
 50mm, 65mm
 80mm, 100mm
 150mm, 200mm

T-MOUNTING TYPE
 D-DIN
 S-STD.
 W-WITHOUT _ T-mounting

CONNECTION TYPES
 T-TERMINAL BOX
 2C - ALARM SWT ONLY PLUG AND SOCKET CONNECTOR
 4C - ALARM AND TRIP SWT ONLY PLUG AND SOCKET CONNECTOR
 5C - ALARM AND TRIP SWT ONLY PLUG AND SOCKET CONNECTOR

Dial size
 4" OFI 1100 RL XX NO 150-2a T X
 6"

Type
 OFI: Oil Flow Indicator
 WFI: Water Flow Indicator

Flow Rate at Full Flow (LPM)

Dial type 1a-2c (See illustration)

SWITCH CONFIGURATION (% OF FULL FLOW RATE)
 AT - Alarm 75% (±5%) & Trip 65% (±5%)
 AO - Alarm only 75% (±5%)
 OA - Alarm only 65% (±5%)
 AX - Alarm 75% (±5%) & Trip at No flow
 AN - Alarm only 70% (±5%)

Single Switch

TYPE- 1a (Standard), TYPE- 1b, TYPE- 1c

Double Switch

TYPE - 2a (Standard), TYPE - 2b, TYPE - 2c

Alternatively, orders can be placed by specifying all of the following

- 1) Pipe size
- 2) Full flow rate in LPM
- 3) Liquid in pipe
- 4) Specific gravity of liquid (If other than mineral transformer oil or water)
- 5) Flow direction (Specify only one direction)
- 6) Dial markings
- 7) Number of switches and switch setting
- 8) Quantity against each configuration

Due to our policy of continuous product improvement, dimensions and designs are subject to change.

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